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I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004902083 for a patent by ROBERT UDEN as filed on 19 April 2004.

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Twenty-ninth day of April 2005

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TEAM LEADER EXAMINATION
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PROVISIONAL SPECIFICATION

APPLICANT: Robert Uden
NUMBER:
FILING DATE:

Invention Title: IMPROVED WATER CONDITIONER

The invention is described in the following statement:-

IMPROVED WATER CONDITIONER

Area of the Invention

Water Conditioners perse are well known and normally comprise a conditioning unit which is located in a pipe through which water is to be passed the conditioner unit having a convulated outer surface to ensure that as water moves through the pipe a substantial part of this actually contacts either the pipe itself or the conditioning unit. The conditioning unit if maintained at a potential relative to the pipe, either by electrochemical effects of by applying an EMF thereto and it has been found that the quality of the water which passes from the conditioner is substantially better than that which is unconditioned. One particular application where the water is being used as an input to a boiler or cooling tower the scale which would normally form on the device is substantially reduced and often close to eliminated.

These systems have been extremely valuable in practice particularly for small and medium volume application. The conditioners have normally been cast and, to an extent, can be considered to have a substantial diameter relates to the internal diameter of the pipe as it is necessary to obtain the required water flow as discussed above.

When one gets into larger diameter pipes then the conditioning unit can become of a substantial size and this makes it very expensive to cast and the total unit weight is very high.

It is an object of the invention to provide a water conditioner which minimises these difficulties.

The water conditioner of the invention comprises a plate adapted to be located in a pipe and having, on at least one side thereof a number of means which cause water to adopt a required torturous flow through the pipe.

In a particular form of the invention the plate can be provided with a number of posts which can pass therethrough and which are normal thereto and a number of ribs, the posts and ribs providing the required torturous path for water through the conditioner.

In a preferred form of the invention the ribs may be longitudinal but regularly displaced from the longitudinal axis and the ribs adjacent the centre of the plate can be higher than those adjacently edge of the plate so that when the conditioner is located in the pipe it substantially fills the interior of the pipe.

It is preferable that the ribs are of a height equivalent to the height of the adjacent posts but within the diameter of the pipe.

In order that the invention be more readily understood we shall describe one particular embodiment of the invention together with some possible variations.

The particular embodiment can be deemed to be one that will fit a 200 millimetre internal diameter pipe, but it is to be appreciated that this is to be purely for descriptive purposes.

In this case the central plate is approximately 200 millimetres wide by 520 millimetres long. The plate may be made of stainless steel or brass but other materials could be used.

On the plate I provide four rows of posts each of which lie normal to the plate and each of which extends a equal distance on either side of the plate.

In the preferred form, the central row of posts lie effectively on the longitudinal axis of the plate and have a height substantially equivalent to the diameter of the pipe, that is that they extend of the order of 100mm on each side of the plate.

In the embodiment there may be three such posts one centrally along the length of the plate and the other two spaced there from.

The two adjacent rows may have four posts two of which are located centrally between the three posts of the centre row and the remaining two adjacent the

ends of the plate and the outer rows may be located in position equivalent to that of the central row.

As the posts are located outwardly from the centre line so their length are reduced so that they terminate close to the internal periphery of the pipe when the plate and posts are located therein.

Between the rows of posts, and outwardly of the outer rows there can be ribs which extend effectively the whole length of the plate and can be formed so that where they enclose a post they are at their widest spacing and centrally of these positions are at narrower spacing. Thus in plan the ribs have the effective wave shapes.

The ribs are welded to the plate and it well be seen, initially considering the ribs between rows of posts there is a path which, as far as the centre row is concerned starts relatively narrow, as the ribs are inwardly of the two outwardly located posts extend outwardly to pass on either side of the post of the row, are deformed inwardly to pass between the two adjacent posts, are deformed outwardly again to pass on either side of the post of the row and so on so that the passage various from narrow to broad to narrow. The two adjacent passages are effectively the same but offset so they go from broad to narrow to broad and so on.

Externally of the ribs which are outwardly of the outer rows of posts there may be additional rows or part rows of ribs.

The height of the ribs will, as with the height of the posts vary from the tallest at the central rows to the shortest at the outer rows so that the conditioning unit generally can be received within the pipe with which it is to be used and to effectively ensure that there is no great spaces where water can streamline flow through the pipe.

Means are provided to retain the unit within the pipe and this may be by tapping one or more of the posts so that a bolt can pass through an aperture in the pipe and to be threaded into the taped hole or holes or alternatively we could provide brackets to hold the plate in position within the pipe.

The method of connection of the plate to the pipe is of no importance to the invention.

The arrangement of the conditioning area is such that water entering the pipe passes between a pair of ribs and if it is in the central portion of the pipe will be caused to move outwardly around the posts be directed out towards the adjacent rib which is converging will then be permitted to move outwardly as the ribs commence to diverge until the next post is struck and so on.

This will mean that the water will not adopt a streamline flow and over its transit through the device will make physical contact with posts or ribs.

The water which passes around the outer portion of the plate will tend to move between ribs but again these are relatively closely spaced, are also shaped so the water will, again, contact the ribs or the pipe at some stage during this passage.

At the inlet side of the device I may provide an orifice which is in the form of a truncated cone and tends to direct the water more towards the central portion of the device than the outer edges, but this is not critical.

Adjacent each end of the pipe I may provide a flange or the like by means of which the device can be connected into a pipeline.

In use a voltage can be applied to the device in a manner which is well known in the art and water is caused to move along the pipe thus through the conditioning unit and back to the pipe with, during the conditioning step, striking the ribs or the posts or the outside periphery of the pipe and any entrained material tends to receive an electrical charge.

The actual operation of the device is conventional.

We have found that a conditioner of the size described will be just over half the weight of a conventional conditioner of the same size and we have also found that because the overall inclusion of the pipe is substantially less than if there is a substantial central casting, which had previously been the case and in fact the through put is approximately 50% more than using a more conventional device.

It will be appreciated that once conditioners are used in pipes of a diameter greater than 200mm the size and weight of the casting will increase at a rate very much greater than the increase of the diameter of the pipe and also the efficiency will reduce as the annularly between the outer surfaces of the conditioner and the inner surface of the pipe must be retained at a level such that all of the water passing through is still caused to strike the conditioner or the pipe.

For larger diameter pipes the new construction will be substantially more satisfactory than previous versions they will be cheaper to fabricate rather than to cast the conditioning unit they will have very much greater through put, as the exposed area of the conditioner can be substantially greater than with a cast unit and they will be very much lighter than the equivalent size cast unit and even lighter if one is looking at the equivalent throughput cast unit.

Whilst we have described one particular configuration of the unit of the invention it is to be understood that various other configurations could provide an

equivalent water flow and equivalent effectiveness and any such change would be in the scope of the invention.

DATED this 19th Day of April 2004

ROBERT UDEN

By his Patent Attorneys

A TATLOCK & ASSOCIATES